

# Session 1 Panel Discussion

- **Questions:**
  - What lessons and success stories have we learned from 20th century cancer epidemiology?
  - What are the gaps and provocative questions that epidemiologic research can fill in the next 12 years?
- **Moderator:** Robert T. Croyle, Ph.D., DCCPS, NCI
- **Panelists:**
  - David Hunter, Sc.D., M.P.H.  
*Harvard University*
  - Timothy Rebbeck, Ph.D.  
*University of Pennsylvania*
  - Margaret R. Spitz, M.D.  
*Baylor College of Medicine*

David Hunter, Sc.D., M.P.H.  
*Harvard University*

# Where is the US NATIONAL COHORT? – FOR CANCER IT EXISTS!

	Cohort Size			Years			Minorities		Blood Yes/No
	Male	Female	Total	Base	Last	F/U	AA	Other	
<b><u>US Initial Cancer Cohort Consortium (BPC3)</u></b>									
Nurses I & II	0	238,130	238,130	1976	2010	34	4,999	6,663	Yes
MEC	96,863	118,388	215,251	1993	2007	14	35,107	104,359	Yes
CPS II	86,403	97,786	184,189	1992	2006	14	2,628	2,329	Yes
WHI	0	161,809	161,809	1994	2010	16	14,563	11,326	Yes
PLCO	73,162	75,522	148,684	1993	2009	16	7,708	8,394	Yes
HPFS	48,074	0	48,074	1986	2007	21	531	877	Yes
WHS	0	39,876	39,876	1992	2009	17	909	971	Yes
PHS I & II	29,071	0	29,071	1982	2009	27	265	1,880	Yes
<b>Total</b>	<b>333,573</b>	<b>731,511</b>	<b>1,065,084</b>				<b>66,710</b>	<b>136,799</b>	
<b><u>US Enlarged Cohort Consortium (pancreas, glioma)</u></b>									
Ag Health	55,967	33,689	89,656	1993	2007	14	1,562	892	No
Vital	37,382	40,339	77,721	2000	2008	8	898	2,560	No
CLUE	21,579	28,171	49,750	1974	2010	36	782	0	Yes
NYU	0	14,274	14,274	1985	2006	21	1,437	854	Yes
Rad Tech	1,844	8,311	10,155	1926	2006	80	789	252	Yes
<b>Total</b>	<b>392,534</b>	<b>814,295</b>	<b>1,206,829</b>				<b>69,827</b>	<b>140,213</b>	
<b><u>US Caucasian and African-American Cancer Consortia</u></b>									
SCCS	34,950	51,080	86,030	2002	2011	9	55,580	950	Yes
Black Women	0	59,001	59,001	1995	2008	13	59,001	0	No
Sister	0	50,884	50,884	2003	2011	8	4,600	2,869	Yes



NCI Funded (Infrastructure)

EXPOSURE DATA

DIVERSITY



Timothy Rebeck, Ph.D.  
*University of Pennsylvania*

Multilevel Model from: Warnecke 2005

Cancer  
↑

**Social Conditions and Policies**  
Culture, Racism, Sexism, Poverty  
Discrimination, Public Policies

**Institutions**  
Health Care System, Families,  
Community-based organizations,  
Legal System, Media, Political System

**Neighborhoods**  
Collective Efficacy, Access, Social  
Cohesion, Segregation,  
Neighborhood Disadvantage,  
Neighborhood Stability

**Social Relationships**  
Social Networks, Social Support  
Social Influences, Social Engagement

**Individual Risk Factors**  
Age, SES, Education, Obesity,  
Tobacco Use, Acculturation,  
Diet, Race

**Biologic/Genetic Pathways**  
Metabolic Processes,  
Genetic Mechanisms

Fundamental Causes  
Social Organization  
Individual Factors  
Biology

*Epidemiology in the:  
20<sup>th</sup> Century      21<sup>st</sup> Century*

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Environmental  
Epidemiology

Molecular/  
Genetic  
Epidemiology

Social Epidemiology

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Multilevel Epidemiology

Margaret R. Spitz, M.D.  
*Baylor College of Medicine*

# Discovery

What are the "big", "understudied", "neglected" or "provocative" questions?

## Smoking

- How to uncover heritability of lung cancer?
- What are functional consequences of variants?
- G-E interactions? Role of nicotine dependence?
- Can we refine risk prediction?

## Obesity

- What have we learned about obesity genetics?
- Is association reversible if obesity is treated?
- What is role of brown adipose tissue?
- How does colon microbiome affect body fat?

## Integrative Epidemiology - The time for "big science"

cohesive; apply new technologies; interdisciplinary collaborative studies

### Lung Ca Genetic Susceptibility

Replication studies  
Fine-mapping, resequencing  
WES, WGS  
Functional genomics  
Intermediate phenotypes- COPD  
Extreme phenotypes  
Risk assessment models

### Mechanisms of Obesity/Cancer link

Advanced phenotype measurements  
Novel imaging  
Extreme phenotypes  
Bariatric surgery - metabolomics  
Regulators of BAT determination  
Pre-clinical models  
Gut microbiome

## Translation

who to screen?

obesity prevention/Rx